IN THE CLAIMS

Please cancel claims 1-3, 6-13, 15 and 16 and add claims 17-24

1-16 (cancelled)

17. (new) A method, comprising:

(a) forming a chimeric DNA by joining

(i) a first DNA comprising a first DNA segment encoding a cleavage domain and an N-terminal portion of a gamma methylase domain of a first Type IIG restriction endonuclease, to

(ii) a second DNA comprising a second DNA segment encoding a specificity domain and a C-terminal portion of a gamma methylase domain of a second Type IIG restriction endonuclease,

wherein the first and second Type IIG restriction endonucleases are characterized by a gamma methylase domain having motifs X, I, II, III, IV, V, VI, VII, and VIII, such that the first and second DNA segments are joined at a site next to or within motif I or motif IV;

(b) transforming a host cell with the chimeric DNA to express a chimeric Type IIG restriction endonuclease; and

(c) determining whether the chimeric Type IIG restriction endonuclease has restriction endonuclease activity.

18. (new) A method according to claim 17, wherein the first DNA is deficient in methylase activity.

19. (new) A method according to claim 17, wherein the second DNA is deficient in DNA cleavage activity.

20. (new) A method according to claim 17, further comprising: additionally determining whether the chimeric Type IIG restriction endonuclease has methylase activity.

21. (new) A method according to claim 17, further comprising:

(a) ligating the first DNA to the second DNA, wherein the first DNA is formed by restriction endonuclease cleavage of a DNA encoding the first Type IIG restriction endonuclease, and the second DNA is formed by restriction endonuclease cleavage of a DNA encoding the second Type IIG restriction endonuclease; or

(b) selecting primers for amplifying the first and second DNA fragments by two-step PCR, to form the chimeric Type IIG restriction endonuclease.

22. (new) A method according to claim 21, wherein ligating the first DNA and the second DNA utilizes a linker DNA between the first DNA segment and the second DNA segment.

23. (new) A method according to claim 22, wherein the linker contains a restriction endonuclease cleavage site, the cleavage site being unique within the DNA encoding the restriction endonuclease.

24. (new) A method according to claim 17, wherein the host cell of step (b) is a *dinD::lacZ* indicator strain and step (c) further comprises: an *in vivo* SOS induction assay to determine restriction endonuclease activity of the chimeric Type I G restriction endonuclease.